Claims

It is claimed:

1. A method for manufacturing of an optical fiber with a decoupling interface for scattered light to monitor a power of light guided within said optical fiber, said optical fiber comprising a core having a first refractive index and a cladding surrounding said core, said cladding having a second refractive index being smaller than said first refractive index, a portion of said optical fiber in a region of said decoupling interface being substantially straightly aligned,
   - in which method the optical fiber is electro-thermally treated at an intermediate position within said substantially straightly aligned portion, such that a partial mixture of core material and cladding material and, thereby, formation of scattering centers occurs in an interface region between said core and said cladding, thereby forming said decoupling interface for scattered light from said so modified intermediate position.

2. The method according to claim 1, wherein said optical fiber is severed at said intermediate position substantially perpendicular to the fiber axis prior to said electro-thermal treatment of said optical fiber so that two free fiber ends result, and said two free fiber ends are directly spliced to each other at their front surfaces, said two spliced fiber ends thereby being substantially straightly aligned, and wherein said electro-thermal treatment is performed as a subsequent treatment of the spliced intermediate position.

3. The method according to claim 2, wherein said splicing step of said two fiber ends is carried out with a small lateral offset of the fiber ends.

4. The method according to claim 1, wherein during said electro-thermal treatment of said optical fiber the light power guided through the optical fiber is monitored, and wherein the electro-thermal treatment is completed as soon as a desired damping of said power is achieved.

5. The method according to claim 1, wherein said decoupling interface is surrounded by a light scattering, light refracting or light reflecting material, or by a material being light absorbing and subsequently light emitting, the portion of detectable scattered light thereby being modified.

6. The method according to claim 1, wherein said electro-thermal treatment of said intermediate position is carried out by applying an electric arc.

7. The method according to claim 1, wherein said electro-thermal treatment of said intermediate position is carried out by applying several successive electric arcs having time intervals between each other.

8. The method according to claim 7, wherein the intensity of said electric arcs varies.

9. The method according to claim 1, wherein a detector for detecting scattered light emitted from said decoupling interface of said optical fiber is provided at said decoupling interface.

10. The method according to claim 5, wherein said decoupling interface is surrounded by a granular material.

11. The method according to claim 10, wherein said granular material is glass powder.

12. The method according to claim 11, wherein said glass powder has a particle diameter of < 100 μm.

13. The method according to claim 11, wherein said glass powder has a particle diameter of between 40 μm and 60 μm.

14. The method according to claim 5, wherein said decoupling interface is surrounded by a fluorescent or phosphorescent material.

15. The method according to claim 9, wherein said decoupling interface and said detector are commonly surrounded by an absorbing material in order to provide protection against scattered light coming from undesired directions.

16. The method according to claim 15, wherein silicon carbide or carbon powder is used as absorbing material.

17. The method according to claim 1, wherein the optical fiber is provided with at least one feature which refers to the respective feature of a single-mode fiber, of a multi-mode fiber, of a polarization-preserving optical fiber, of a laser-active optical fiber, or of a photonic crystal fiber.

18. A use of an optical fiber manufactured according to the method described in claim 9 for monitoring the power of

light from a light source when controlling the power of the light source, said light being guided through said optical fiber.

19. A use of an optical fiber manufactured according to the method described in claim 9 for monitoring the power of light from a light source when controlling the efficiency of in-coupling said light of said light source into said optical fiber, said light being guided through said optical fiber.

20. A device with an optical fiber and a control loop for controlling the power of light of a light source, said light being guided through said optical fiber,

- said optical fiber being manufactured according to the method described in claim 9 and whose detector being connected to the control loop as an actual-value transducer.

21. The device according to claim 20, wherein said decoupling interface is surrounded by a fluorescent or phosphorescent material for a wavelength conversion of said scattered light.